

Acetylene

Material Safety

Data Sheet

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ISSUE DATE January 31, 1978 AND REVISIONS February 13, 1981	TRADE NAME AND SYNONYMS Acetylene, Ethyne, Ethine	CHEMICAL NAME AND SYNONYMS Acetylene, Ethyne, Ethine
	FORMULA C ₂ H ₂ MW: 26.04	CHEMICAL FAMILY Alkynes

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

Acetylene is classified as a simple asphyxiant and has no threshold limit value (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED

Symptoms such as headaches, dizziness, shortness of breath, and loss of consciousness may occur if the gas is present in quantities sufficient to dilute the oxygen concentration in air. Symptoms of anoxia occur only when the gas concentrations are within the flammable range and the mixture has not ignited. (DO NOT ENTER AREAS WITHIN THE FLAMMABLE RANGE DUE TO THE IMMEDIATE FIRE AND EXPLOSION HAZARD.) Use a suitable flammable gas meter (explosimeter) calibrated for acetylene to measure concentrations of gas in the air.

TOXICOLOGICAL PROPERTIES

Acetylene is a simple asphyxiant, irritant, and anesthetic. About 100 mg per liter may be tolerated for 0.5 - 1.0 hour. There is no experimental evidence of chronic harmful effects.

RECOMMENDED FIRST AID TREATMENT

First degree and minor second degree thermal burns from fires should be immersed in cool water for 30 minutes. Major second and third degree burns should be covered in the cleanest material available. Seek immediate aid of physician. Persons suffering from lack of oxygen should be moved to areas with normal atmosphere. Assisted respiration and supplemental oxygen should be given if the victim is not breathing.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) 0F (-18C) (CC)	AUTO IGNITION TEMP 581F (305C)	FLAMMABLE LIMITS In air @ 1 atm	LEL 2.5%	UEL 100%
EXTINGUISHING MEDIA Carbon dioxide, dry chemical, Halon.			ELECTRICAL CLASSIFICATION GROUP Class 1, Group A	

SPECIAL FIRE FIGHTING PROCEDURES

Stop gas flow and fight fire conventionally. Use water spray to keep cylinders or other containers cool if exposed to fire. Keep personnel well away since containers can rupture violently when exposed to fire. For additional information, see Compressed Gas Association Safety Bulletin SB-4.

UNUSUAL FIRE AND EXPLOSION HAZARDS

ACETYLENE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. IT MAY DECOMPOSE VIOLENTLY IN ITS FREE STATE UNDER PRESSURE IN EXCESS OF 15 PSIG. It burns with an intensely hot flame. Potential explosion hazard exists from reignition if fire is extinguished without shutting off acetylene source. Ignites very easily due to low minimum ignition energy; very wide flammable limits. Acetylene gas has an approximate specific gravity of 1.0 and tends to stay in pockets rather than dissipate.

PHYSICAL DATA

BOILING POINT (°F.) @ 1 atm -119.2F (-84.0C)		FREEZING POINT (°F) @1 atm -113.4 (-80.8C)	
VAPOR PRESSURE (psia) @ 62.2F (16.8C) 590 psia (40 atm)		SOLUBILITY IN WATER @ 64F (18C), 1 atm 1.0 CuFt/CuFtH2O	
VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR =1)	LIQUID DENSITY (lb/cu ft)	SPECIFIC GRAVITY (H2O = 1)

478816



@ 68F (20C), 1 atm 0.0681	@ 68F (20C), 1 atm 0.906	@ -116 (-82C), 1 atm 38.76	@ -116F (-82C), 1 atm 0.621
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APPEARANCE AND ODOR

Acetylene is colorless and odorless. Impurities in carbide generated acetylene impart a characteristic garlic-like odor.

DISCLAIMER

Information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use. Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

FORM # 284-ALL-02

REACTIVITY DATA

STABILITY	UNSTABLE	<input checked="" type="checkbox"/>	CONDITIONS TO AVOID Never utilize free gas outside the cylinder at pressures in excess of 15 psig. Avoid mechanical shocks to containers of acetylene, Never expose cylinders or acetylene systems to sources of heat.
	STABLE	<input type="checkbox"/>	

INCOMPATIBILITY (Materials to avoid)

Oxidizers such as oxygen, and halogens. Forms explosive compounds with copper, brass, copper salts, Hg Hg salts, K, Ag and Ag salts, and HNO₃.

HAZARDOUS DECOMPOSITION PRODUCTS

Acetylene will decompose into elemental carbon and hydrogen under the above conditions.

HAZARDOUS POLYMERIZATION	MAY OCCUR	<input type="checkbox"/>	CONDITIONS TO AVOID None
	WILL NOT OCCUR	<input checked="" type="checkbox"/>	

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Ventilate area to prevent flammable mixture from forming. Remove sources of ignition, heat, sparks, etc. Avoid entering area of flammable atmosphere. Carefully remove cylinders with slow leaks to a remote outdoor location. Contact Brown Industries for assistance.

WASTE DISPOSAL METHOD

Do not attempt to dispose of residual gaseous acetylene in cylinders. Return to Brown Industries for disposal.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Oxygen-deficient atmospheres are in the flammable range. DO NOT ENTER. Respirators will not function.

VENTILATION Natural or mechanical where gas is present.	LOCAL EXHAUST	SPECIAL Mechanical ventilation for enclosed storage areas must meet National Electrical Code requirements for Class 1, Group A
	MECHANICAL (General)	
	OTHER	

PROTECTIVE GLOVES

Ordinary leather work gloves recommended for cylinder handling. Welders gloves required for cutting and welding operations.

EYE PROTECTION

Safety glasses recommended for handling cylinders. Welders goggles, etc., required for cutting and welding.

OTHER PROTECTIVE EQUIPMENT

Leather sleeves, leather apron and other standard protective equipment for cutting and welding.

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

Acetylene shipments must be in accordance with Department of Transportation (DOT) regulations using the DOT "FLAMMABLE GAS" label. Consult DOT regulations for details on the shipping of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS

Use only in well ventilated areas. Acetylene gas cylinders contain gas at high pressure and should be handled with care. Use a pressure-reducing regulator set at less than 15 psig. Always keep acetylene cylinders upright and secure cylinders when in use. Never expose an acetylene cylinder to heat. Always open and close acetylene valves slowly. Return cylinders to Brown Industries with positive pressure and cylinder valve closed. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

Storage of 2500 cubic feet or less is permissible within buildings. Storage in excess of 2500 cubic feet must be outdoors or in well ventilated special rooms or buildings. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Keep acetylene cylinder storage areas away from storage of oxygen and other oxidizers. Storage areas should be free of combustible material. Avoid exposure to areas where salt or other corrosive chemicals are present. Store acetylene cylinders with the valve end up. See Compressed Gas Association Pamphlet P-1 and National Fire Protection Association Standard No. 51 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS

Acetylene is packaged in cylinders meeting DOT specification 8 or 8AL. The cylinder contains a porous filler saturated with acetone. The acetylene stored in the cylinder is dissolved in acetone. A full cylinder should not exceed 250 psig @ 70F.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Acetylene cylinders should be stored and used in an upright position. When using acetylene, close the cylinder valve before shutting off the regulator to permit the gas to bleed from the regulator. Avoid hazardous mixtures and sources of ignition. Formation of explosive copper acetylides can be avoided by using copper alloys proved successful through use in industry. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

Special Rules for the use of Acetylene Cylinders

(provided courtesy of National Welders Supply Inc. <http://www.nwsco.com>)

1. Acetylene should never be used at a pressure exceeding 15 pounds per square inch.
2. Acetylene cylinders should be used and stored in an upright position to avoid possibility of drawing out acetone.
3. Keep sparks and flame away from Acetylene cylinders.
4. Never use Acetylene from cylinders through blowpipes or other devices equipped with shut off valves on the Acetylene supply connections, without reducing the pressure through a suitable regulator attached to the cylinder valve.
5. After removing valve cap, open valve for a moment to clear opening of dust or dirt particles.
6. After attaching regulator and before cylinder valve is opened, see that adjusting screw of the regulator is released. Always keep the Acetylene cylinder valve key or wrench on the cylinder while in use. Never open an Acetylene cylinder valve more than one full turn; then, in case of fire, the valve can be closed immediately.
7. Before regulator is removed from a cylinder, close the cylinder valve and release all gas from regulator.
8. Never attempt to transfer Acetylene from one cylinder to another nor to mix any other gas with it in the cylinder.
9. The wrench used for opening the cylinder valve should always be kept on the valve stem when cylinder is in use.
10. When returning empty cylinders, see that valves are closed to prevent evaporation of acetone.
11. Never, under any circumstances, attempt to refill an Acetylene cylinder.
12. Never test for Acetylene leaks with an open flame. Use an approved leak detector or solution.

13. Do not place Acetylene cylinders near furnaces, boilers or other sources of high temperature, or hot metal. Never attempt to drain an Acetylene cylinder by placing it close to a stove or a furnace. Let cylinders warm slowly in cold weather to room temperature to permit full discharge of gas.
14. Do not use a partly discharged Acetylene cylinder to supply a large welding or heating tip for outdoor work in very cold weather. Use filled cylinders stored for several hours in warm rooms.
15. Acetylene must be stored at least 20 feet from Oxygen storage.
16. Acetylene cylinders stored inside of buildings, except those in actual use or attached to lines ready for use, must be limited to a total gas capacity of 2000 cubic feet.